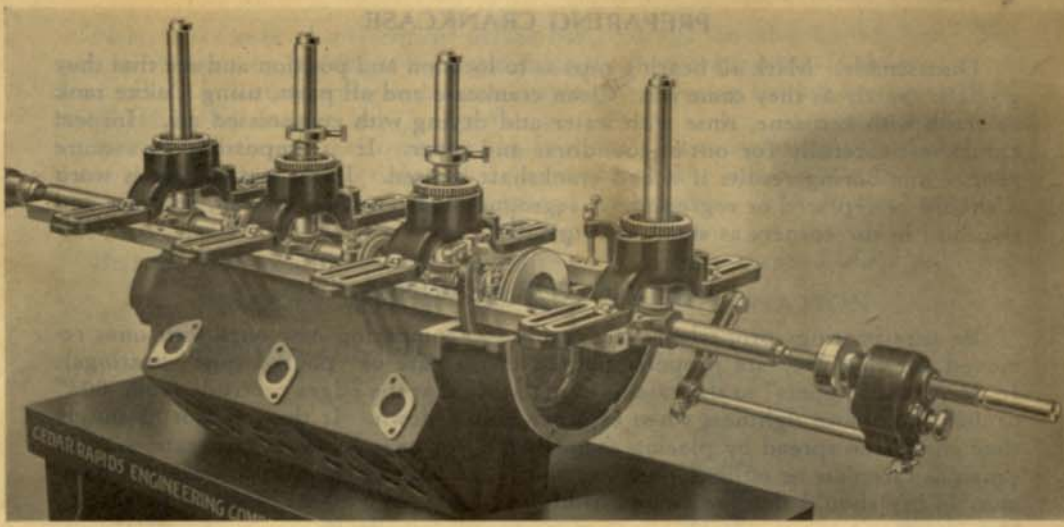


INSTRUCTIONS FOR OPERATING THE KWIK-WAY MAIN BEARING LINE BORING MACHINE WITH 70" BORING BAR AND OTHER SPECIAL EQUIPMENT

The equipment furnished with this machine is as follows:

1 Boring Bar 70" long (Special).
2 Flat Parallel Bars 62" long (Special).
5 Bridge Assemblies (Special, Long) with special, long Bar Bearings.
1 Pinion Wrench for Locking Bridge Ball.
3 Compensating Collars.
3 Compensating Springs.
1 Feed Assembly with Special Long Connecting Link.
2 Feed Nuts for Flanging.
4 Boring Tools.
1 Hone for Sharpening Tools.
4 Flanging Tools (3 Rear and 1 Front).
1 Handcrank for Turning Bar.
1 Flexible Coupling for Driving Bar.
1 Micrometer for Setting Tools.
1 Hollow Head Setscrew Wrench.
6 Special C-Clamps.
6 Bolts and C-Washers (Special for Ford).
2 Centering Gauges (Special for Ford).
4 Centering Pins for Ford Centering Gauges.
9 pairs centering rings, sizes 2", 2⅛, 2¼, 2⅜, 2½, 2⅝, 2¾, 2⅞, 3".
1 Inside Bearing Gauge.
2 5/16" Capscrews.
13 7/16" Capscrews.
13 7/16" Washers.
1 Steel Case.

It is important that you study the following instructions carefully, even if you have serviced main bearings with other line boring machines.

First, check each part against the parts list. Next, clean all parts thoroughly, oiling parts that might rust.

PREPARING CRANKCASE

Disassemble. Mark all bearing caps as to location and position and see that they go back exactly as they came off. Clean crankcase and all parts, using Oakite tank or scrub with kerosene, rinse with water and drying with compressed air. Inspect crankshaft carefully for out-of-roundness and taper. It is impossible to secure proper line boring results if a bad crankshaft is used. If the crankshaft is worn it should be replaced or reground. A reground shaft must be smooth, accurate and the radii in the corners as small as originally.

FITTING THE BEARINGS

Be sure bearings properly fit the crankcase, comparing new ones with ones removed (or that they are properly poured in the case of "poured type" bearings). In fitting the "uppers" to the case, it is advisable that the edges protrude from .002" to .005" to assure tightness when caps are bolted down. If they do not fit snugly they should be spread by placing them face down on a smooth, accurate surface (such as faceplate or milling machine table) and tapping them with a wooden hammer. They should then be tapped firmly in place, using a soft block of wood.

NOTE: DO NOT TAP END INSERT BEARINGS IN UNTIL AFTER CENTERING THE BAR AND CLAMPING BRIDGES IN PLACE AS EXPLAINED LATER.

Insert bearings should be fitted into caps in much the same way as explained above. First, place the bearing in cap, then place cap (face down) on a smooth surface. Then, the insert may be forced firmly in place by tapping the cap with a hammer. Bearing edges should be filed smooth with the cap, keeping the face accurate. Best results will be obtained by using a surface plate or a piece of plate glass (with a piece of emery cloth on it) rubbing cap back and forth (with bearing firmly in place) until smooth and accurate.

With all bearings in place, plug all air lines with small bits of rags (BEING SURE TO REMOVE RAGS WHEN LINE BORING IS COMPLETE AND JOB PROPERLY CLEANED). Place all caps (except ends) in place and bolt them down EXACTLY AS THEY WILL BE WHEN JOB IS ASSEMBLED. (End caps are left off and end bearings out for centering boring bar.)

Be sure capscrews are put in same place during line boring as in assembly after line boring. An accurate Torque Indicating Wrench should be used to duplicate tightening torque in assembly as compared with line boring tightening.

CENTERING BORING BAR

With insert bearings removed from ends of crankcase, select centering rings that fit snugly. (Special centering gauges are furnished for Ford "poured-type" bearings, as explained later.) IT IS IMPORTANT THAT CENTERING RINGS FIT SNUGLY INTO BEARING CASTINGS AND THAT THEY "BOTTOM" PROPERLY. If they seem a little loose, use thin shim or paper of uniform thickness.

Place the two parallel bars on the crankcase panrails (after removing burs with a mill file) using the special C-clamps and capscrews provided (see Figures 3 and 4 for Ford engines).

Slide boring bar through centering rings, having two bar bearings properly spaced inside the centering rings (3 bar bearings on long crankcases where 5 bridges are used). Next, place the other two bar bearings on the boring bar, outside the end mains (one at the front end, one at the rear).

Next, make sure of adjustment of the bar bearings on the boring bar. Try each bar bearing by rocking it back and forth on the boring bar. If there is looseness, tighten adjusting screw with screw driver until bearing has a noticeable (BUT NOT HEAVY) drag on bar.

Next, place the bridges over the bar bearings. Then determine the best location for the bridges where they will least interfere with "miking" the boring tools and bearings and be as nearly evenly spaced as possible. The figures given in Tables 1, 2, and 3 are based on equal spacing of bridges.

Bolt the bridges to the parallel bars, using the capscrews and washers provided.

"SAG" OF BORING BAR AND ITS ELIMINATION

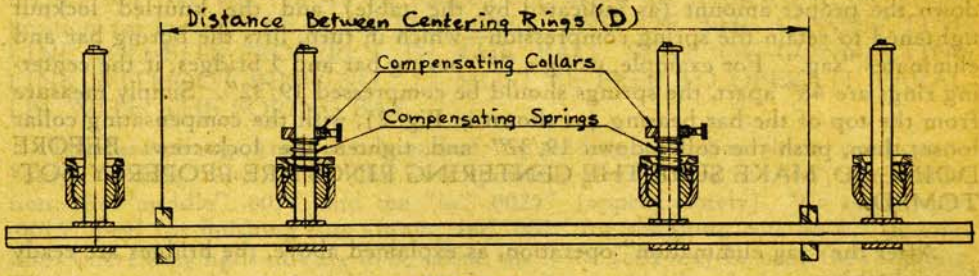


FIGURE 1

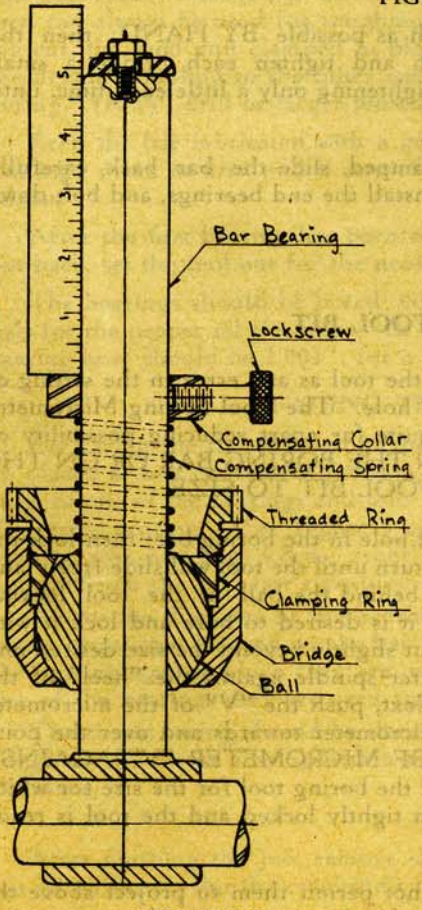


FIGURE 2

TABLE NO. 1

(For Standard 50" Bar)

D Distance Between Centering Rings	S. C.—Spring Compression	
	Springs On Inner Bar Bearings	Springs On Outer Bar Bearings
40	3/4"	
36	9/16"	
32	5/16"	
28	0	0
24		3/8"
22 (Ford)		1/2"
20		5/8"

TABLE NO. 2

(For Special 60" Bar)

D Distance Between Centering Rings	S. C.—Spring Compression	
	4 Bridges (2 Sprirgs)	5 Bridges (3 Springs)
48	29/32"	25/32"
44	3/4"	11/16"
40	9/16"	17/32"
36	5/16"	9/32"
32	0	0

TABLE NO. 3

(For Special 70" Bar)

D Distance Between Centering Rings	S. C.—Spring Compression	
	4 Bridges (2 Springs)	5 Bridges (3 Springs)
56	7/8"	3/4"
52	25/32"	11/16"
48	21/32"	19/32"
44	15/32"	7/16"
40	1/4"	1/4"
36	0	0

Before tightening the bridges to the bar bearings, it is important to correct the "sag" of the boring bar in order to do a precision job. To do this the feedscrew and drive coupling should not be attached to the boring bar and the bar should be located centrally in the centering rings. See Figures 1 and 2 and Tables 1, 2, and 3 which give self-explanation. The compensating springs and collars furnished make it possible to eliminate "sag" of the boring bar during the centering operation. After putting the springs and collars on the bar bearings (as covered by the illustrations), leave the knurled lockscrew loose. Next, refer to the appropriate table (Table 1, 2 or 3) and determine how far the springs must be compressed for the particular set-up. Then, using an ordinary scale, measure from the top of the bar bearing stem to the compensating collar, after which the collar should be pushed down the proper amount (as indicated by the table) and the knurled locknut tightened to retain the spring compression—which in turn, lifts the boring bar and eliminates "sag." For example, using a 70" boring bar and 5 bridges, if the centering rings are 48" apart, the springs should be compressed 19/32". Simply measure from the top of the bar bearing (as shown in Fig. 2), with the compensating collar loose; then, push the collar down 19/32" and tighten the lockscrew. BEFORE DOING SO, MAKE SURE THE CENTERING RINGS ARE PROPERLY BOTTOMED.

After the "sag elimination" operation, as explained above, the bridges are ready for tightening.

In doing this, tighten end bridges as much as possible BY HAND; then the center bridges. Next, take the pinion wrench and tighten each bridge a small amount. Then go over all bridges, in order, tightening only a little each time, until each one is firmly clamped.

When the bridges have all been firmly clamped, slide the bar back carefully from either end, remove the centering rings, install the end bearings, and bolt down the bearing caps.

SETTING THE TOOL BIT

Extreme care must be exercised in setting the tool as any error in the setting of a "fly cutting" tool is doubled in the finished hole. The Tool Setting Micrometer furnished for this purpose has graduations quite far apart reducing possibility of error. BE SURE THERE IS NO DIRT ON THE BORING BAR OR ON THE MICROMETER WHEN SETTING THE TOOL BIT TO SIZE.

Place the boring tool in the proper tool bit hole in the boring bar; then lock the setscrew. Next, back the setscrew out ¼ to ½ turn until the tool will slide freely and yet have a noticeable drag due to the spring behind the ball in the tool locking mechanism. Set the micrometer for the size it is desired to bore and lock it with the knurled setscrew. Push the boring tool out slightly beyond the size desired and then carefully press the end of the micrometer spindle against the "heel" of the tool to get it nearly to the correct setting. Next, push the "V" of the micrometer down firmly against the bar and rotate the micrometer towards and over the point of the tool. KEEP A FIRM PRESSURE OF MICROMETER "V" AGAINST THE BAR. The movement described will set the boring tool for the size for which the micrometer was set. The setscrew is then tightly locked and the tool is ready for use.

CAUTION: In loosening setscrews, do not permit them to project above the surface of the bar, otherwise they will damage bar bearings.

BORING THE BEARINGS

In boring the bearings two cuts should be taken—a roughing cut and a finishing cut. About .005″ should be left for the finishing cut. A bad finish can only be caused by one of three things. First—a dull tool; second—improper adjustment of bar bearings; third—not having the parallel bars firmly clamped to crankcase.

Place the feedscrew in one end of the bar and tighten the setscrew firmly. Next, place feeding unit on the screw, with the split nut end nearest the crankcase.

Now run the connecting link rod through the feed nut, with the ball-shaped end towards the crankcase. The connecting link casing should be bolted to the end of one of the parallel bars. Then, by making the necessary adjustment of the connecting link rod, you can set the feeding unit along the feedscrew to the proper position for boring. BE SURE THE BALL END OF THE CONNECTING LINE ROD FITS PROPERLY IN THE BALL SEAT OF CONNECTING LINK WITHOUT BINDING. IT MUST BE FREE TO OPERATE PARALLEL WITH THE BORING BAR.

The feed change knob at one end of the feeding unit has three positions—"out," "middle," and "in." The "out" position gives a feed of .010″ per revolution; the "middle" .005″, and the "in" .0025″ (approximately). We recommend .0025″ feed for finishing cuts always, and .005″ for roughing cuts only. In some cases where only light cuts are to be taken, the .010″ feed may be used for roughing. The above is for electric drill drive. Where the bar is turned with the crank, the .010″ feed can always be used for roughing. After the tool has been set for the roughing cut, the feed unit clamped in place, and the split feed nut engaged, assemble the flexible coupling to the other end of the bar, attach an electric drill and start boring. (A ½″ drill or larger must be used—smaller drills would be too fast.)

Keep the bar lubricated with a good grade of light motor oil. Feel the bar bearings, often at first, and if any of them tend to overheat, stop the bar and readjust.

After the first bearing has been rough bored, disengage the feed nut, pull the bar back, set the tool out for the necessary amount, and take finishing cut.

The bearings should be bored .001″ per inch larger than the crankshaft journals for the proper oil clearance. In other words, for a 2″ diameter crankshaft, the bearing bore should be 2.002″; for a 2½″ diameter it should be 2.0025″, etc.

FACING THRUST BEARINGS

For facing the thrust bearings the flange feed nuts must be used. These may be placed at any convenient position along the bar, so as to bear against opposite sides of one of the bearings and thus feed the bar and flanging tool endwise to face the thrust bearing. (See Figure 3 and 4.) The "rear" nut is to be used nearest the operator, and both words "front" and "rear" stamped on the nuts should read upright from the operator's position.

Where the diameter of the bearings is too large for the flange feed nuts, centering rings must be used on the bar (as spacers) between the flange feed nuts and the bearing against which they are used. The size of rings to use depends on the size of the bearings they are used against.

The thrust facing should be done by hand, using the crank. Determine the length of the thrust bearing with a micrometer—allowing from .004″ to .007″ end clearance.

FINAL

After finishing the job, remove the machine, blow out all shavings, and clean out all oil lines. Put the crankshaft in place, put light oil on all journals, and bolt down all caps.

If the bearings have been properly bored and the thrust bearing properly faced and filleted, the crankshaft should turn freely by hand. If it does not, you may find that some of the caps are not centered. Loosening and tightening them, or striking the crankshaft with a lead hammer should center them up and free the shaft.

FORD BLOCKS

In line boring Ford blocks the same general procedure is followed as for other engines, the main difference being in the methods of centering and bolting main bearing caps to the crankcase. Centering rings are always used for centering the bar in Ford engines that have "shell type" bearings. The special Ford centering gauges are used in Ford engines with the "poured type" bearings.

On any Ford block which has been rebabbitted preparatory to line boring, you should first of all make sure that the babbitt is filed down flush with the finished surfaces of the block to which the caps are to be bolted. This is **important,** because the Ford centering gauges rest on these finished surfaces (at the two end bearings) and locate the bar, vertically, from them.

After making sure that these surfaces are smooth, flat and free from any burs, make the machine set-up as closely as possible to the illustration in Figure 3 for "A" and "B" Ford and in Figure 4 for V-8 85 and 95 Ford.

After making the complete set-up as illustrated (except for the flange feed nuts which are used, of course, only for facing the flanges), place the special Ford centering gauges over the end bearings, and insert the centering pin in the proper holes of the gauges and on through into the holes of the crankcase. The bridge balls must be loose, of course, at this time.

NOTE: The ½" diameter is for "A" and "B"; the .524" diameter is for V-8 and the 9/16" is for tractor blocks. On V-8's with studs no centering pins are needed, as the gauges will center properly over the studs themselves.

Then swivel the gauge clamps around under the bar, tighten the knurled handwheels to pull the bar firmly up to the gauges, and finally tap the gauges lightly with a hammer down against the block. Next, clamp all four of the bridge balls with the special pinion wrench and then remove the two centering gauge pins. After removing these pins, try to turn the centering gauges on the bar, to see if there is any "rock." If these gauges do "rock" back and forth it indicates that the bar is too high, caused by the gauges not being down tight against the block when the bridges were clamped. In this case the bridges should be loosened and the bar recentered. Care in the use of the centering gauges, however, will enable you to center accurately the first time in every case.

Due to the inconvenience of using the regular Ford bolts and because they will not accurately center the caps, special, quick-acting bolts are furnished to be used while boring Model A and B Ford blocks. These bolts are made to fit the holes in the caps and block much closer than the regular bolts. (Special bolts are not necessary on V-8 Fords because the caps fit into grooves in the block—thus centering themselves.)

To use the quick-acting bolts, place the cap with the desired amount of shims in place and pass the bolts through the cap holes and on down through the holes in the block. (Short bolts in the rear cap.) Then insert the special "C" washers over the end of the bolt and tighten the nut at the top end.

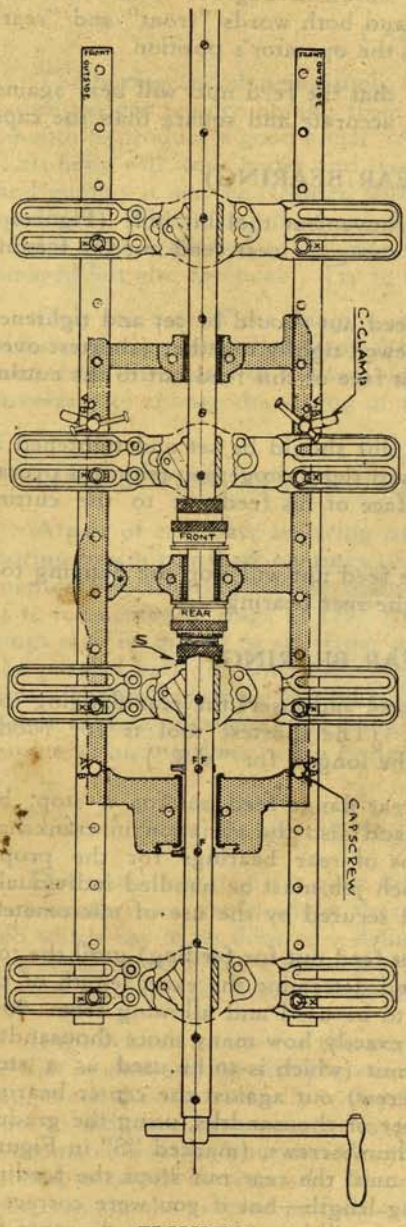


FIGURE 3

Setup for A & B Fords

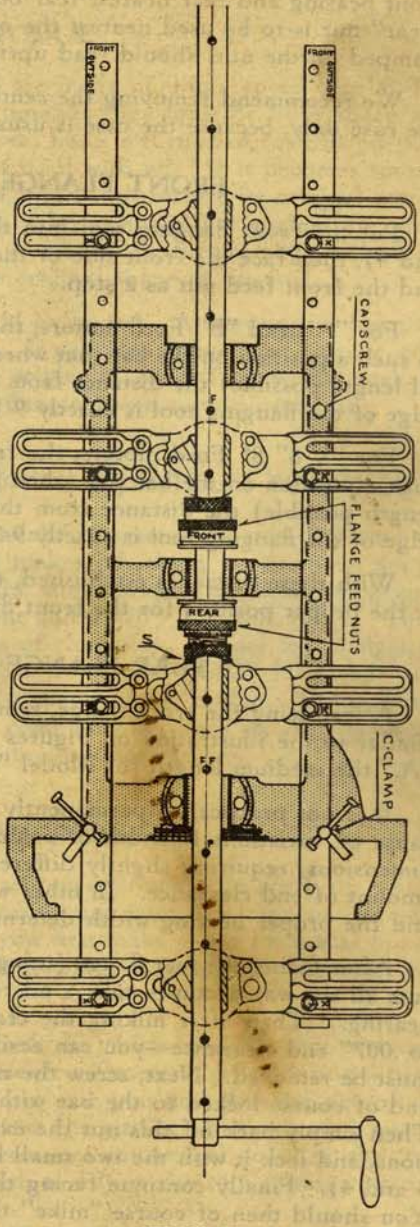


FIGURE 4

Setup for V-8 85 & 95 Fords

FACING THE REAR (THRUST) BEARING

To face the flanges of the rear (thrust) bearing on a Ford block, put the flange feed nuts on the boring bar, one on either side of the center main, front nearest front bearing and rear nearest rear bearing, as shown in Figures 3 and 4. The "rear" nut is to be used nearest the operator, and both words "front" and "rear" stamped on the nuts should read upright from the operator's position.

We recommend removing the center cap so that the feed nuts will bear against the case only, because the case is usually more accurate and square than the caps.

FRONT FLANGE (OF REAR BEARING)

Put the front flanging tool into the most convenient tool bit hole (Figures 3 and 4), then face the front side of the bearing using the **rear feed nut for feeding** and the **front feed nut as a stop.**

For "A" and "B" Ford motors, the front feed nut should be set and tightened in such a position on the bar that when it is screwed tightly together (shortest over-all length possible) the distance from the thrust face of this feed nut to the cutting edge of the flanging tool is exactly 9-15/32".

For "V-8" 85 Ford motors, the front feed nut should be set and tightened in such a position on the bar that when it is screwed tightly together (shortest overall length possible) the distance from the thrust face of his feed nut to the cutting edge of the flanging tool is exactly 9-5/16".

With these distances established, the flange feed nut will stop the flanging tool at the proper position for the front flange of the rear bearing.

REAR FLANGE (OF REAR BEARING)

After facing the front flange, remove the tool and insert the rear flanging tool similar to the illustration on Figures 3 and 4. (The shortest tool is for Model "A," the medium length for Model "B" and the longest for "V-8.")

It is not practical to permanently set the rear flange feed nut for a stop, because of variations in width of center mains and also the variation in crankshaft dimensions, requiring slightly different lengths of rear bearings for the proper amount of end clearance. In other words—each job must be handled individually and the proper bearing width determined and secured by the use of micrometers.

After facing the rear flange **(using the front feed nut for feeding)** until the tool cuts all the way around—take a micrometer and determine the exact length of the bearings. Then after miking the crankshaft to be used and allowing from .004" to .007" end clearance—you can easily figure exactly how many more thousandths must be removed. Next, screw the rear feed nut **(which is to be used as a stop,** and of course locked to the bar with the setscrew) out against the center bearing. Then simply back off this nut the exact number of thousandths, using the graduations, and lock it with the two small knurled thumbscrews, (marked "S" in Figures 3 and 4). Finally continue facing the flange until the rear nut stops the feeding. You should then of course "mike" the bearing length—but if you were correct in your figures and careful in your work, the bearing will have the proper clearance for your crankshaft.

After the job is finished put in the crankshaft and clamp up—using the regular bolts and the same shims used in boring.

If you have several Ford blocks to bore, you can save time by leaving the bridges clamped to the parallel bars and merely unclamping the bars from the

crankcase. The entire machine can then be moved to another block. In centering the bar on the next block, however, be sure to loosen the four bridge balls and re-tighten them after re-centering. This is necessary because of the variation in Ford crankcases.

CARE OF TOOLS

The boring and flanging tools furnished are made of high speed steel. The cutting edges require honing from time to time, as they must be both sharp and smooth to produce a good finish. A small hand hone is furnished for this purpose. This hone will work better and last longer if used with oil. If it becomes smooth and gummy it may be cleansed with gasoline, which will restore its original cutting qualities. When using the hone, keep the face being honed flat against the stone. If the edge is allowed to dig into the hone, not only the cutting edge will be destroyed but also the hone. Try to retain the original shape of the tools.

Only the face of the flanging tools should be honed. Attempting to hone the sides of these tools will destroy their shape. It will also move the cutting edge back from the center of the tool, where it is originally cut. This would make it necessary to change the setting of the Ford flanging feed nut adjustments.

LINE BORING CHEVROLET 1938-39-40-41 CAMSHAFT BEARINGS

A pair of camshaft centering cones is available (as an extra) for centering the boring bar in camshaft bearings of various makes of engines. A more simple method for centering for camshaft work in the above models of Chevrolet engines is to use centering rings (2.159" for the front and 1.970" for the rear). These rings may be turned to size from other rings of close size. Locate the bridges on the parallel bars (on the camshaft side) with 7/16" x 2½" SAE Hexhead Capscrews through the long vertical holes near the center of the bridge. These should be put in first. Fastening the bridges is then completed by using the regular length capscrews and washers in the bridge slots at the opposite end.

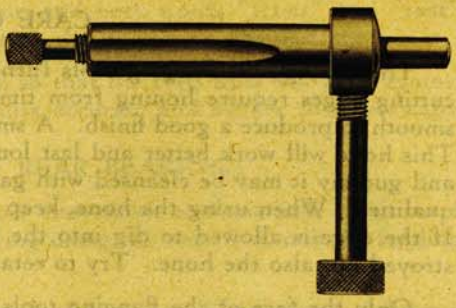
ADJUSTING THE MICROMETER

Due to the fact that it is quite difficult to set one micrometer to check up exactly with another, we would advise that before boring any main bearings, or for any job which has to be done to a definite size, you first make a test by actual boring and checking up to see if the tool setting micrometer corresponds with the mike you use for checking the bearing bore sizes.

It is advisable to use for this purpose a crankcase which has a 2" bore or larger so that in checking the size you can use an inside micrometer. After boring a bearing, check the size carefully with your mike. In case you find that the size of the bore as indicated by your mike is different from the size at which the tool setting micrometer was set, you should make the necessary adjustment so that the two micrometers will correspond. In case you wish to adjust the tool setting micrometer, you should proceed as follows:

After boring and miking a bearing, simply leave the small knurled thumbscrew of the micrometer locked tight in the position used for setting the tool. Then loosen the thimble setscrew with the special hollow head setscrew wrench and turn the thimble around until the reading corresponds to the size of the bored hole as indicated by your mike. Then lock the thimble setscrew as tightly as possible, and repeat the operation of boring and checking on another bearing.

INSIDE BEARING GAUGE FOR USE WITH KWIK-WAY LINE BORING MACHINE



Two additional adjusting screws and two additional plungers of different lengths are furnished with each gauge. Measuring capacity of gauge 1⅞" to 4".

The use of the Inside Bearing Gauge will provide for the utmost accuracy in bore sizes. It is inserted through the hole in the boring bar nearest the boring tool. IMPORTANT: THE TOOL BIT LOCKSCREW MUST THEN BE ADJUSTED SO THE GAUGE WILL SLIDE FREELY IN THE TOOL BIT HOLE. IT MUST BE FREE SO THE SPRING INSIDE THE GAUGE WILL PRESS BOTH ENDS OF THE GAUGE FIRMLY AGAINST THE SIDES OF THE BEARING BORE. After the roughing cut, the boring bar is moved so as to place the Gauge inside the bearing. Loosening the knurled headed lockscrew permits the Gauge to expand to the size of the bearing.

After expanding the Gauge in the bearing and **before tightening the lockscrew** to retain the measurement, the boring bar should be turned slightly. Then tighten the lockscrew. This eliminates the possibility of error resulting from the Gauge denting the soft metal as it expands.

The Gauge may then be left in the bar or removed and the measurement taken by "miking" the Gauge with an outside micrometer.

CAUTION: AFTER USING THE GAUGE AND REMOVING IT FROM THE HOLE, BE SURE TO TIGHTEN THE TOOL BIT SCREW DOWN BELOW THE SURFACE OF THE BORING BAR.

When the actual diameter bored by the tool on the rough cut is known, the micrometer furnished with the machine can be set out the exact amount required to produce the desired finished size.

DONT'S

CAUTION: In loosening setscrews, do not permit them to project above the surface of the bar, otherwise they will damage bar bearings.

Don't use a crankshaft that is worn flat, tapered or out-of-round.

Don't use inferior replacement bearings.

Don't bore the crankcase of a motor with removable cylinder block without the block being bolted to the case.

Don't try to use Prussian Blue on main bearings that have been line bored. In the first place, the oil clearance makes a blue test unsatisfactory. Second, the case and bearings are not under the same stress or strain with the caps off as when it is clamped up. If the bearings are all bored to the desired sizes, the crankshaft can be placed in, bolted up, ready to run. No scraping or fitting is necessary.

Don't be alarmed if you get a click as the bar is passed through the bar bearings. Experiments in research work show that a misalignment of .0005" (Five tenths of a thousand) will cause a noticeable click.

Don't bolt the crankcase assembly down tight to a metal base or bench, as you may distort it enough to ruin the job.

One very important thing in the line boring of Ford blocks which experience has shown is sometimes overlooked, is the careful cleaning of the finished surfaces of the blocks to which the caps are bolted. The babbitt must be filed down flush and the entire surface should be carefully examined for the Ford centering gauges rest on these and locate the boring bar vertically from them.

April 21, 1942.

CEDAR RAPIDS ENGINEERING COMPANY
of Delaware
CEDAR RAPIDS, IOWA

DECIMAL EQUIVALENTS OF FRACTIONS OF AN INCH

(Advancing by 64ths)

1/64 — .0156	33/64 — .5156
1/32 — .0312	17/32 — .5312
3/64 — .0469	35/64 — .5469
1/16 — .0625	9/16 — .5625
5/64 — .0781	37/64 — .5781
3/32 — .0937	19/32 — .5937
7/64 — .1094	39/64 — .6094
1/8 — .1250	5/8 — .6250
9/64 — .1406	41/64 — .6406
5/32 — .1562	21/32 — .6562
11/64 — .1719	43/64 — .6719
3/16 — .1875	11/16 — .6875
13/64 — .2031	45/64 — .7031
7/32 — .2187	23/32 — .7187
15/64 — .2344	47/64 — .7344
1/4 — .2500	3/4 — .7500
17/64 — .2656	49/64 — .7656
9/32 — .2812	25/32 — .7812
19/64 — .2969	51/64 — .7969
5/16 — .3125	13/16 — .8125
21/64 — .3281	53/64 — .8281
11/32 — .3437	27/32 — .8437
23/64 — .3594	55/64 — .8594
3/8 — .3750	7/8 — .8750
25/64 — .3906	57/64 — .8906
13/32 — .4062	29/32 — .9062
27/64 — .4219	59/64 — .9219
7/16 — .4375	15/16 — .9375
29/64 — .4531	61/64 — .9531
15/32 — .4687	31/32 — .9687
31/64 — .4844	63/64 — .9844
1/2 — .5000	

PARTS PRICE LIST

For Government use, longer bridges, longer bar bearings and a longer feed link have been specified and furnished. These special parts are the first five items listed below. In ordering parts, always give part number and description.

Part No.	Part Name	Material	Price Ea.
LG-100	Bridge Assembly (including bar bearing)	CI	$24.75
LG-101	Bridge only (without other parts)	CI	9.30
LG-110	Bar Bearing	CI	5.00
LG-110-S	Bar Bearing with 30° ear	CI	7.50
L-155-L	Feed Link	CI	1.15

The following are standard parts:

Part No.	Part Name	Material	Price Ea.
L-100	Bridge Assembly		$24.75
L-101	Crankcase Bridge	CI	9.30
L-102	Ball	CI	3.95
L-104	Threaded Ring	FC	4.50
L-105	Clamping Ring (bridge bearing cup)	FC	1.25
L-106	Clamping Ring Key Screw	FC	.10
L-107	Pinion Wrench with handle	FC	2.50
L-109	Bearing Adjustment Screw	Jalcase	
L-110	Bar Bearing	CI	5.00
L-111x	Ford Centering Gauge (No. 1)	CI	2.00
L-112x	Ford Centering Gauge (No. 2)	CI	2.00
L-113	Centering Gauge Foot	CRS	.25
L-114	Centering Gauge Stud	FC	.25
L-115	Centering Gauge Handwheel	FC	.50
L-117x	Centering Gauge Pin (For Ford A. B, V-8)	Jalcase	.75
L-118x	Centering Gauge Pin (For Tractors)	Jalcase	.75
L-130	Centering Ring Arbor	Jalcase	3.50
L-131	Cam Shaft Centering Cone	FC	5.00 Pr.
L-141	Bearing Cap Bolt (Long)	3135 SAE	1.20
L-142	Bearing Cap Bolt (Short)	3135 SAE	.95
L-145	Bearing Cap Nut	CRS	.45
L-147	Bearing Cap C-Washer (with either long or short handle)	Jalcase	
L-148	C-Washer Handle (Long)	FC	.50
L-149	C-Washer Handle (Short)	FC	
L-151-42	Parallel Bar—42″ long	CRS	13.00 Pr.
L-151-52	Parallel Bar—52″ long	CRS	17.00 Pr.
L-151-62	Parallel Bar—62″ long	CRS	21.00 Pr.
L-152	Washer	Jalcase	.10
L-155	Feed Link	CI	1.15
L-156	Feed Link Lockscrew	FC	
L-156½	Lockscrew Pin	FC	.35
L-157	Feed Link Rod	FC	.50
L-161	Clamp	Mall. I.	.75
L-162	Clamp Foot	Jalcase	.30
L-163	Clamp Screw	Jalcase	.40
L-164	Clamp Screw Swivel	FC	.20
L-166	Clamp Screw Handle	FC	.05

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Part No.	Part Name	Material	Price Ea.
L-167	Handle Endpiece	F C	.05
	(C Clamp Complete — $1.25)		
L-171	Compensating Collar (complete with spring)	F C	1.00
L-172	Collar Lockscrew	F C	
L-175	Bar Bearing Safety Washer	Jalcase	.35
L-176	Washer Screw	F C	.25
L-177	Spring Plunger	F C	.05
L-201-50	Boring Bar—50" long	Ground Shafting	$19.50
L-201-60	Boring Bar—60" long	Ground Shafting	25.50
L-201-70	Boring Bar—70" long	Ground Shafting	31.50
L-204	1⅜" Boring Tool	H. Sp. St.	1.05
L-204½	1-11/16" Boring Tool	H. Sp. St.	1.05
L-205	2" Boring Tool	H. Sp. St.	1.05
L-205½	2-5/16" Boring Tool	H. Sp. St.	1.05
L-206	Front Flange Tool	H. Sp. St.	1.30
L-207	Rear Flange Tool (Long)	H. Sp. St.	1.30
L-207½	Rear Flange Tool (Extra Long)	H. Sp. St.	1.30
L-208	Rear Flange Tool (Medium)	H. Sp. St.	1.30
L-209	Rear Flange Tool (Short)	H. Sp. St.	1.30
L-212	Tool Bit Screw	Jalcase	.10
L-214	Crank Rod	F C	.30
L-215	Crank Rod Setscrew	Jalcase	.10
L-216	Crank Handle	C I	1.20
L-218	Crank Rod Coupling	F C	.90
L-221	Micrometer Body	CRS	4.20
L-222	Micrometer Nut	Bronze	3.75
L-223	Adjustment Nut	F C	.25
L-224	Micrometer Screw	F C	4.40
L-225	Micrometer Screw End Plug	40-50 Pt. C. St.	
L-226	Micrometer Thimble	F C	2.75
L-229	Micrometer Lockscrew	F C	.15
L-230	Lockscrew Plug	Brass	.05
	(Complete Micrometer — $15.55)		
L-231	Feed Screw	F C	5.95
L-232	Gear Case "A"	C I	2.50
L-232½	Gear Case "B"	C I	2.50
L-233	Gear Case Gasket	Victorite	.15
L-234	Feed Gear Shaft	F C	1.00
L-235	Sliding Shaft	F C	.80
L-236	Sliding Shaft Knob	F C	.35
L-237	Sliding Key	CRS	.25
L-238	Feed Gear Spacer	Jalcase	.40
L-239	Feed Gear Key	CRS	.25
L-241	Feed Gear No. 1	F C	2.00
L-242	Feed Gear No. 2	F C	2.00
L-243	Feed Gear No. 3	F C	2.00
L-244	Feed Gear No. 4	F C	2.00
L-245	Feed Gear No. 5	F C	2.00
L-246	Feed Gear No. 6	F C	2.00
L-247	Feed Gear No. 7	F C	2.00
L-248	Feed Gear No. 8	F C	2.00
L-250	Gear Case Lockscrew and Pin	F C	.35
L-251	Feed Nut Body	F C	1.80

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Part No.	Part Name	Material	Price Ea.
L-252	Feed Nut Body Plate	F C	.80
L-254	Feed Nut	Bronze	3.70
L-255	Feed Nut Pivot	F C	.05
L-256	Feed Nut Release Pin	F C	.20
L-257	Release Pin Handle	CRS	.40
	(Feed Mechanism Complete — $39.85)		
L-260	Flange Feed Nut Assembly		5.95
L-261x	Front Flange Feed Screw	F C	1.50
L-261½x	Rear Flange Feed Screw	F C	1.50
L-262x	Front Flange Feed Nut	F C	1.85
L-262½x	Rear Flange Feed Nut	F C	1.85
L-263	Pointed Lockscrew	Jalcase	.10
L-264	Inner Ball Thrust Collar	Jalcase	.50
L-264½x	Outer Ball Thrust Collar	Jalcase	1 15
L-265	Ball Retainer	F C	.50
L-266	Flat Lockscrew	Jalcase	.10
L-267	Lockscrew Plug	Brass	.05
L-268	Adjustment Screw	Jalcase	.15
L-275	Flexible Shaft Coupling Unit	Steel	2.95
L-281	Flanging Head	C I	8.75
L-282	Flanging Tool	H. Sp. St.	
L-283	Filleting Tool	H. Sp. St.	
L-301x	Display Board	Sheet Iron	6.30
L-303	Display Board Bracket	1" x ⅛" Angle Iron	1.35
L-304	Brace Rod	F C	.40
L-305	Capscrew Tray	Sheet Iron	.50
L-306	Clamp Bracket	Sheet Iron	.15
L-307	Bolt and Tool Bit Holder	C I	2.00
L-308	Bar Bearing Holder	C I	.75
L-310	Centering Ring Pins	F C	.30
L-311	Display Board Ferrule (Long)	Tubing	.20
L-312	Display Board Ferrule (Short)	Tubing	.10
	Hardened Cap Screw for Parallel Bars		.05
	¼" Snap Oil Cups		.05
	Extra Centering Rings (up to and including 2¼") per pair		1.60
	Extra Centering Rings (larger than 2¼" — up to and including 3") per pair		2.25
	Extra Centering Rings (larger than 3" — up to and including 3½") per pair		2.75
	Extra Centering Rings (larger than 3½" — up to and including 4") per pair		3.25

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CEDAR RAPIDS ENGINEERING COMPANY
of Delaware
CEDAR RAPIDS, IOWA

April 21, 1942.

PACKING LIST
KWIK-WAY MODEL LG LINE BORING MACHINE

1	Boring Bar - 70"
2	Flat Parallel Bars - 62"
5	Bridge Assemblies
3	Bar Bearings - 90° opening
2	Bar Bearings - 30° opening
1	Pinion Wrench for Looking Bridge Ball
3	Compensating Collars
3	Compensating Springs
1	Feed Assembly with Connecting Link
2	Feed Nuts for Flanging
4	Boring Tools
1	Hone for Sharpening Tools
4	Flanging Tools (3 Rear and 1 Front)
1	Hand Crank for Turning Bar
1	Flexible Coupling for Driving Bar
1	Micrometer for Setting Tools
2	Hollow Head Setscrew Wrenches
6	Special C Clamps
6	Bolts and C Washers (Special for Ford)
2	Centering Gauges (Special for Ford)
4	Centering Pins for Ford Centering Gauges
18	Centering Rings
~~2~~	~~5/16" Capscrews~~
13	7/16" Capscrews
13	7/16" Washers
1	Inside Bearing Gauge
1	Steel Box
1	Instruction Book

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